

PATENT
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Attorney Docket No. 06028.0020-00000

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:)
Hervé BURGAUD et al.) Group Art Unit: 1751
Application No.: 10/611,968) Examiner: Eisa B. ELHILO
Filed: July 3, 2003) Confirmation No.: 3634
For: DYE COMPOSITION FOR)
KERATIN FIBERS CONTAINING)
AN ALDEHYDE PRECURSOR,)
ENZYME AND HYDRAZONE, AND)
METHODS USING THIS)
COMPOSITION)

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Sir:

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

In support of the Notice of Appeal filed herewith, pursuant to 37 C.F.R. § 41.37, Appellants present this brief and enclose herewith a check for the fee as required under 37 C.F.R. § 41.20(b)(2). This appeal is in response to the Office Action dated March 22, 2007, rejecting claims 1-10 and 12-36, all of which are set forth in the attached Appendix.

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I. Real Party in Interest

L'Oréal S.A. is the assignee of record, as evidenced by the assignment recorded March 29, 2004, at Reel 015150, Frame 0242, and as such, L'Oréal S.A. is the real party in interest in this appeal.

II. Related Appeals and Interferences

Appellants, Appellants' undersigned legal representative, and the assignee know of no appeals, interferences, or proceedings that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1-10 and 12-36 are pending.

The Examiner has rejected claims 1-10 and 12-36 under 35 U.S.C. § 103(a).

The Examiner has objected to claims 7 and 8 as being dependent on a rejected claim.

As argued below, Appellants believe that the rejected claims are patentable.

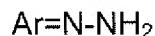
IV. Status of Amendments

All amendments have been entered. No amendments have been made subsequent to the Submission Under 37 C.F.R. § 1.114 filed March 1, 2007.

V. Summary of Claimed Subject Matter

It was known in the art to carry out oxidation dyeing of keratin fibers using oxidizing systems employing hydrogen peroxide and/or enzymes. See Specification at p. 2, II. 5-11. It was also known that aldehydes can be used for dyeing keratin fibers, see *id.* at I. 17; however, compositions comprising aldehydes are known to be highly reactive compositions which require special handling, see *id.* at 3, II. 9-10. In the present case, Appellants found that dye compositions comprising aldehydes freshly produced by the biochemical reaction of at least one aldehyde precursor and at least one enzyme capable of producing an aldehyde from the at least one aldehyde precursor may have improved non-toxic characteristics and may avoid the risks related to handling highly reactive products such as aldehydes. See *id.* at II. 6-12.

Independent claim 1 is directed to a dye composition for dyeing keratin fibers comprising, in an appropriate dyeing medium, at least one aldehyde precursor, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and at least one heteroaromatic hydrazone. The at least one heteroaromatic hydrazone is able to generate a colored substance by reaction with an aldehyde and is chosen from hydrazones having the formula



wherein Ar is chosen from heterocycles with 5 or 6 links comprising at least one nitrogen atom; and condensed polycyclic heteroaromatic groups with 9 or 10 links comprising at least one nitrogen atom, and

wherein Ar can optionally be substituted on the nitrogen atoms by a substituent chosen from C₁ to C₄ alkyls, C₁ to C₄ alcohols, and C₁ to C₄ ethers.

Independent claim 19 is directed to a method for dyeing keratin fibers, comprising

applying to the keratin fibers a dye composition comprising, in an appropriate dyeing medium, at least one aldehyde precursor, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde, and leaving the dyeing composition on the keratin fibers for a time sufficient to develop a desired color on the keratin fibers;

wherein the at least one heteroaromatic hydrazone is chosen from hydrazones having the formula Ar=N-NH₂ where Ar is defined above.

Independent claim 32 is directed to a method for dyeing keratin fibers, comprising mixing a first composition with a second composition to form a ready-to-use dye composition, wherein the first composition comprises, in an appropriate dyeing medium, at least one aldehyde precursor, and the second composition comprises, in an appropriate dyeing medium, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and further wherein at least one of said first composition and said second composition additionally comprises at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde and chosen from hydrazones having the formula Ar=N-NH₂ where Ar is defined above, and

applying said ready-to-use dye composition to the keratin fibers.

Independent claim 36 is directed to a multi-compartment device for dyeing keratin fibers comprising a first compartment comprising a first composition, and a second compartment comprising a second composition, wherein the first composition comprises, in an appropriate dyeing medium, at least one aldehyde precursor; the second composition comprises, in an appropriate dyeing medium, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor; and wherein at least one of said first composition and said second composition further comprises at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde and chosen from hydrazones having the formula Ar=N-NH₂ as defined above.

VI. Grounds of Rejection to be Reviewed

A. Claims 1-10 and 12-36 stand rejected under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent Application Publication No. 2002/0059682 to Hoeffkes et al. ("Hoeffkes") in view of U.S. Patent No. 3,634,013 to Benshein et al. ("Benshein").

VII. Argument

A. Claims 1-10 and 12-36 Are Patentable Under 35 U.S.C. § 103(a) Over *Hoeffkes* in view of *Benshein*

Claims 1-10 and 12-36 have been rejected under 35 U.S.C. § 103(a) as obvious over *Hoeffkes* in view of *Benshein*. Appellants respectfully submit that the Examiner has not established a *prima facie* case of obviousness; therefore, this rejection is legally improper and should be reversed.

1. The Legal Standard

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or non-obviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 USPQ 467; see also *KSR Int'l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007), slip op. at 2.

Thus, in order to satisfy the initial burden of establishing a *prima facie* case of obviousness, the Examiner must first show that the prior art references teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). The Examiner must also show that there is some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to

modify or combine the references. *In re Rouffet*, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998). The Supreme Court, in the recent decision in *KSR Int'l Co. v. Teleflex, Inc.*, recognized that a showing of “teaching, suggestion, or motivation” could provide helpful insight in determining whether the claimed subject matter is obvious under Section 103(a). *KSR*, slip op. at 14.

In addition, the Supreme Court mandated that “[t]o facilitate review, this analysis [of whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue] should be made explicit.” *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Federal Circuit, 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)).

Following the *KSR* decision, the Office issued a memorandum to its technology center directors on May 3, 2007, indicating that **“in formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.”** (Emphasis in original).

2. The Examiner Has Not Established A *Prima Facie* Case of Obviousness

The Examiner asserts that *Hoeffkes* “teaches a dyeing composition comprising primary alcohol ethanol as an aldehyde precursor...at least one enzyme of alcohol oxidase...and at least one heteroaromatic hydrazone.” See Office Action dated March

22, 2007 (“Office Action”) at 2. The Examiner concedes that *Hoeffkes* does not teach the presently claimed hydrazones, and relies on *Benshein* to disclose this element of the claims. See Office Action at 3. The Examiner relies on *Hoeffkes*’ general disclosure of heterocyclic hydrazones on page 2, paragraph [0018] as providing the requisite motivation for one of ordinary skill in the art to combine the teachings of *Hoeffkes* and *Benshein*. See *id.*

More specifically, *Hoeffkes* describes a composition for dyeing keratin fibers comprising a dye precursor and a phenol-oxidizing enzyme which can be obtained from the *Stachybotrys* species (see page 1, paragraph [0010]). In addition to the phenol-oxidizing enzyme, the composition may optionally further comprise additional enzymes such as alcohol oxidases. See page 7, paragraph [0129]. The Examiner, pointing to paragraph [0211] of *Hoeffkes*, alleges that ethanol serves as an aldehyde precursor. See Office Action at 2.

To the contrary, however, Appellants note that ethanol is described as an optional additive or auxiliary component, which is listed among myriad different auxiliary components. See page 7, paragraph [0131] – page 11, paragraph [0234]. Furthermore, ethanol is described as a solvent or solubility promoter (see page 11, paragraph [0211]), not as an aldehyde precursor. Indeed, nothing in *Hoeffkes* teaches or remotely suggests the use of aldehydes or aldehyde precursors in dye compositions, much less the reaction of aldehydes with hydrazones to produce a dyeing effect. There is no suggestion of, or even an appreciation of the need for, the present inventive concept of producing an aldehyde and then reacting it immediately with at least one heteroaromatic hydrazone to generate a colored substance. Thus, *Hoeffkes* taken

alone does not teach or suggest a composition comprising at least one aldehyde precursor, at least one enzyme, and at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde, as presently claimed. For at least this reason, *Hoeffkes* cannot serve as a proper basis for a *prima facie* case of obviousness.

Benshein, while relied upon for the disclosure of the claimed hydrazones, does not remedy the deficiencies of *Hoefkkes*, because it too fails to teach a composition comprising at least one aldehyde precursor, at least one enzyme, and at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde. As such, *Benshein* goes no further in establishing a *prima facie* case of obviousness of the pending claims than does *Hoeffkes* taken by itself. Appellants thus respectfully submit that, for at least this reason, the combination of these references does not render obvious the pending claims and the rejection should be reversed.

The Examiner further alleges that the skilled artisan would have been motivated to modify the composition of *Hoeffkes* by adding the hydrazones of *Benshein*, but has failed to set forth sufficient evidence of a motivation to modify *Hoeffkes* in the manner proposed. There is simply no teaching in *Hoeffkes* that suggests the desirability of making the modifications proposed by the Examiner, at least not with any reasonable expectation of success, nor has the Examiner pointed to such evidence. The mere fact that the reference can be modified is not sufficient to support a *prima facie* case of obviousness. See M.P.E.P. § 2143.01(III).

In particular, *Hoeffkes* only briefly mentions ethanol and alcohol oxidase as optional additives, and for purposes wholly disconnected with the production of aldehydes. Moreover, as previously discussed on the record, *Hoeffkes* is generally directed to a method for dyeing keratin fibers comprising applying to the fibers a composition comprising at least one dye precursor and at least one phenol-oxidizing enzyme. See abstract. As such, the mechanism of *Hoeffkes* is completely different than that of the claimed invention. *Hoeffkes* utilizes phenol oxidizing enzymes to produce oxygen. The oxygen produced subsequently oxidizes the dye precursor by oxidative condensation, which results in a dye agent. In contrast, according to the present disclosure, an enzyme reacts with an aldehyde precursor to produce an aldehyde, which subsequently reacts with a heteroaromatic hydrazone to form a colored product.

In addition, as presently recited by the claims and as briefly discussed above, the at least one heteroaromatic hydrazone of the present invention is “able to generate a colored substance by reaction with an aldehyde.” See, e.g., claim 1. *Hoeffkes* does not mention or suggest the desirability or utility of a hydrazone capable of generating a colored substance upon reaction with an aldehyde. Indeed, *Hoeffkes* is completely silent with respect to aldehydes, the biological production of aldehydes from aldehyde precursors, and the reaction of aldehydes with hydrazones to produce a dyeing effect. Thus, *Hoeffkes* does not and cannot motivate a skilled artisan to incorporate a hydrazone capable of reacting with an aldehyde to produce a dyeing effect. As such, Appellants assert that, without looking at the present specification for guidance, one of

ordinary skill in the art would have no motivation to modify the teachings of *Hoeffkes* by incorporating the hydrazones of *Benshein* to achieve the presently claimed invention.

In light of the *KSR* decision and the subsequent Office memorandum dated May 7, 2007, when rejecting claims based on a combination of references, it is necessary for the Examiner to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. As there is nothing in the disclosure of *Hoeffkes* which motivates the skilled artisan to incorporate the particular hydrazones of *Benshein*, and the Examiner has not provided any evidence, absent conclusory statements, of such a motivation, Appellants assert that the cited references, taken alone or together, are insufficient to support a proper obviousness rejection. The disclosure of ethanol as an optional additive on page 11 of *Hoeffkes*, the mention of alcohol oxidases as an optional additive in a totally different part of the reference on page 7, and the passing mention of heterocyclic hydrazones in general on page 2, especially in light of the different dyeing mechanism employed by *Hoeffkes* hardly qualifies as a disclosure sufficient to lead a skilled artisan to combine the teachings of *Hoeffkes* and *Benshein* with a reasonable expectation of success of achieving the present invention, as required for a proper obviousness rejection. See MPEP § 2143. As the cited references, either alone or in combination, cannot and do not teach or suggest each and every element of the pending claims as amended, this rejection is improper and Appellants respectfully request that it be reversed.

B. Conclusion

For the reasons given above, pending claims 1-10 and 12-36 are allowable, and Appellants respectfully request reversal of the outstanding rejections.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

Application No. 10/611,968

Attorney Docket No. 06028.0020-00000

To the extent any extension of time under 37 C.F.R. § 1.136 is required to obtain entry of this Appeal Brief, such extension is hereby respectfully requested. If there are any fees due under 37 C.F.R. §§ 1.16 or 1.17 which are not enclosed herewith, including any fees required for an extension of time under 37 C.F.R. § 1.136, please charge such fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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Dated: June 22, 2007

VIII. Claims Appendix

1. (Previously presented) A dye composition for dyeing keratin fibers comprising, in an appropriate dyeing medium, at least one aldehyde precursor, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde;

wherein the at least one heteroaromatic hydrazone is chosen from hydrazones having the formula:



wherein Ar is chosen from heterocycles with 5 or 6 links comprising at least one nitrogen atom; and condensed polycyclic heteroaromatic groups with 9 or 10 links comprising at least one nitrogen atom, and

wherein Ar can optionally be substituted on the nitrogen atoms by a substituent chosen from C₁ to C₄ alkyls, C₁ to C₄ alcohols, and C₁ to C₄ ethers.

2. (Original) The dye composition according to claim 1, wherein the at least one enzyme is derived from an extract chosen from plant, animal, microorganism, virus, differentiated cell and dedifferentiated cell extracts, and wherein said at least one enzyme may or may not be obtained *in vivo* or *in vitro*, may or may not be genetically modified, and may or may not be obtained by chemical or biotechnological synthesis.

3. (Original) The dye composition according to Claim 2, wherein the at least one enzyme is derived from a species chosen from *Plectranthus*, *Pinus*, *Gastropoda*, *Manduca*, *Pichia*, *Candida*, *Pleurotus*, and *Pseudomonas*.

4. (Original) The dye composition according to Claim 3, wherein the at least one enzyme is derived from a species chosen from: *Plectranthus colleoides*, *Pinus strobus*, *Gastropoda mollusc*, *Manduca sexta*, *Pichia pastoris*, *Candida boidinii*, *Pleurotus pulmonarius* and *Pseudomonas pseudoalcaligenes*.

5. (Original) The dye composition according to Claim 1, wherein the at least one enzyme is present in the dye composition in a concentration ranging from 0.005 % to 40 % by weight, relative to the total weight of said dye composition.

6. (Previously presented) The dye composition according to Claim 1, wherein the at least one aldehyde precursor is chosen from amino acids, 2-oxo acids, and primary alcohols.

7. (Previously presented) The dye composition according to Claim 6, wherein the amino acids are chosen from N-6 methyl lysine, dimethylglycine, methyl glutamate, threonine, and sarcosine.

8. (Original) The dye composition according to Claim 6, wherein the 2-oxo acids are chosen from 2-oxoacidpyruvate, benzoylformate, and phenyl pyruvate.

9. (Original) The dye composition according to Claim 6, wherein the primary alcohols are chosen from methanol, ethanol, and benzyl alcohol.

10. (Original) The dye composition according to Claim 6, wherein the concentration of the at least one aldehyde precursor ranges from 0.01% to 40% by weight, relative to the total weight of the composition.

11. (Canceled)

12. (Original) The dye composition according to claim 11, wherein the concentration of the at least one heteroaromatic hydrazone ranges from 0.0005% to 20% by weight, relative to the total weight of the composition.

13. (Original) The dye composition according to any of Claim 1, further comprising at least one oxidation base chosen from paraphenyldiamines, bis-phenylalkylenediamines, para-aminophenols, ortho-aminophenols, heterocyclic bases, and the addition salts thereof.

14. (Original) The dye composition according to Claim 13, wherein the concentration of the at least one oxidation base in the dye composition ranges from 0.0005% to 10% by weight, relative to the total weight of the dye composition.

15. (Original) The dye composition according to Claim 1, further comprising at least one oxidation coupler chosen from metaphenylenediamines, metaaminophenols, metadiphenols, naphthalene couplers, heterocyclic couplers, and the addition salts thereof.

16. (Original) The dye composition according to Claim 15, wherein the concentration of the at least one coupler in the dye composition ranges from 0.0001% to 10% by weight relative to the total weight of the composition.

17. (Original) The dye composition according to Claim 1, further comprising at least one direct dye.

18. (Original) The dye composition according to Claim 1, further comprising at least one oxidizing agent.

19. (Previously presented) A method for dyeing keratin fibers, comprising: applying to said keratin fibers a dye composition comprising, in an appropriate dyeing medium, at least one aldehyde precursor, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde, and leaving said dyeing composition on said keratin fibers for a time sufficient to develop a desired color on the keratin fibers;

wherein the at least one heteroaromatic hydrazone is chosen from hydrazones having the formula:



wherein Ar is chosen from heterocycles with 5 or 6 links comprising at least one nitrogen atom; and condensed polycyclic heteroaromatic groups with 9 or 10 links comprising at least one nitrogen atom, and

wherein Ar can optionally be substituted on the nitrogen atoms by a substituent chosen from C₁ to C₄ alkyls, C₁ to C₄ alcohols, and C₁ to C₄ ethers.

20. (Original) The method according to Claim 19, wherein the keratin fibers are human keratin fibers.

21. (Original) The method according to Claim 20, wherein the human keratin fibers are hair.

22. (Original) The method according to Claim 19, wherein said time sufficient ranges from approximately 3 to 60 minutes.

23. (Original) The method according to Claim 22, wherein said time sufficient ranges from approximately 5 to 40 minutes.

24. (Original) The method according to Claim 19, further comprising, after the color is developed, rinsing said keratin fibers, shampooing said keratin fibers, rinsing again, and drying said keratin fibers.

25. (Original) The method according to Claim 19, wherein the dye composition applied to said keratin fibers further comprises at least one oxidation base chosen from paraphenyldiamines, bis-phenylalkylenediamines, para-aminophenols, ortho-aminophenols, heterocyclic bases, and the addition salts thereof.

26. (Original) The method according to Claim 19, wherein the dye composition applied to said keratin fibers further comprises at least one oxidation coupler chosen from metaphenylenediamines, metaaminophenols, metadiphenols, naphthalene couplers, heterocyclic couplers, and the addition salts thereof.

27. (Original) The method according to Claim 19, wherein the dye composition applied to said keratin fibers further comprises at least one direct dye.

28. (Original) The method according to Claim 19, wherein said color is developed using an oxidizing agent.

29. (Original) The method according to Claim 28, wherein said oxidizing agent is added to the dye composition at the time of use or is comprised in an oxidizing

composition which may be applied to the keratin fibers simultaneously with or sequentially after the dye composition.

30. (Original) The method according to Claim 19, wherein the dye composition applied to said keratin fibers is a ready-to-use composition stored in anaerobic form free of gaseous oxygen.

31. (Original) The method according to claim 19, wherein said at least one aldehyde precursor, said at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and said at least one heteroaromatic hydrazone, are mixed together, in the appropriate dyeing medium, on the keratin fibers.

32. (Previously presented) A method for dyeing keratin fibers, comprising mixing a first composition with a second composition to form a ready-to-use dye composition, wherein

said first composition comprises, in an appropriate dyeing medium, at least one aldehyde precursor, and

said second composition comprises, in an appropriate dyeing medium, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor, and further wherein at least one of said first composition and said second composition additionally comprises at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde, and

applying said ready-to-use dye composition to the keratin fibers;

wherein the at least one heteroaromatic hydrazone is chosen from hydrazones having the formula:



wherein Ar is chosen from heterocycles with 5 or 6 links comprising at least one nitrogen atom; and condensed polycyclic heteroaromatic groups with 9 or 10 links comprising at least one nitrogen atom, and

wherein Ar can optionally be substituted on the nitrogen atoms by a substituent chosen from C₁ to C₄ alkyls, C₁ to C₄ alcohols, and C₁ to C₄ ethers.

33. (Original) The method according to Claim 32, wherein the color is developed using an oxidizing agent.

34. (Original) The method according to Claim 32, wherein said first composition and said second composition are mixed together on the keratin fibers.

35. (Original) The method according to Claim 33, wherein said oxidizing agent is added to the ready-to-use dye composition at the time of use or is comprised in an oxidizing composition which may be applied to the keratin fibers simultaneously with or sequentially after the ready-to-use dyeing composition.

36. (Previously presented) A multi-compartment device for dyeing keratin fibers comprising a first compartment comprising a first composition, and a second compartment comprising a second composition, wherein

- said first composition comprises, in an appropriate dyeing medium, at least one aldehyde precursor;

- said second composition comprises, in an appropriate dyeing medium, at least one enzyme able to generate an aldehyde from the at least one aldehyde precursor; and

wherein at least one of said first composition and said second composition further comprises at least one heteroaromatic hydrazone able to generate a colored substance by reaction with an aldehyde;

wherein the at least one heteroaromatic hydrazone is chosen from hydrazones having the formula:



wherein Ar is chosen from heterocycles with 5 or 6 links comprising at least one nitrogen atom; and condensed polycyclic heteroaromatic groups with 9 or 10 links comprising at least one nitrogen atom, and

wherein Ar can optionally be substituted on the nitrogen atoms by a substituent chosen from C₁ to C₄ alkyls, C₁ to C₄ alcohols, and C₁ to C₄ ethers.

IX. Evidence Appendix

No evidence is being relied upon herein by the Appellant.

X. Related Proceedings Appendix

No related proceeding decisions are relied upon herein by Appellants.